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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,607	07/19/2006	Tetsuya Kohno	293159US3PCT	5945

22850 7590 08/19/2009  
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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DIAZ, THOMAS C

ART UNIT	PAPER NUMBER
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3656

NOTIFICATION DATE	DELIVERY MODE
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08/19/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/586,607	<b>Applicant(s)</b> KOHNO ET AL.	
	<b>Examiner</b> THOMAS DIAZ	<b>Art Unit</b> 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04/21/2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 23 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 23 recites "the curvature radii of each of the corner portions are different". The specification does not explicitly state or support this. The only thing supported by the specification is that adjacent corner portions are different from each other. The drawings also do not clearly show that each of the corners are of different radius of curvature with respect to one another.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 15-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Downs et al. (USP 5951431) in view of Dison et al. (USP 4038189).**

Regarding claim 15, Downs et al. discloses a similar device comprising a casing (fig.3, 112) that defines an internal space (fig.3; inside of casing) and an opening (fig.3, 122a) communicated with the internal space and that is rotatable in a given rotational direction and in a rotational direction opposite to the given rotational direction, the casing including an input portion (fig.3, 38) in which the driving force is input, [the casing being configured such that fatigue life of the casing when the driving force is repeatedly input in the input portion in the given rotational direction is greater than fatigue life of the casing when the driving force is repeatedly input in the input portion in the rotational direction opposite to the given rotational direction, rotation in the given direction being a rotation around a longitudinal rotational axis of the differential gear casing;]

Regarding the functional recitation(s) in the claim(s) above denoted by the “[ ]” the examiner notes while features of an apparatus may be recited either structurally or functionally, claims directed to >an< apparatus must be distinguished from the prior art in terms of structure rather than function. The reference discloses all the claimed structural limitations and therefore anticipates the claim. See MPEP 2114. Additionally, the apparatus is capable of performing the claimed functions.

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Downs et al. discloses a dividing mechanism (fig.9, 34) that is provided in the internal space, and includes a pinion (fig.9, 34) and that divides the driving force into the first output and the second output; and a support member (fig.9, 30) that is provided so as to contact the casing and so as to support the dividing mechanism and that includes a pinion shaft (fig.9, 30) that supports the pinion such that the pinion can rotate on its axis and which makes the pinion revolve around a center of the casing, wherein the fatigue life of the casing is adjusted by making a shape of the opening asymmetrical with respect to the longitudinal rotational axis of the casing (fig.3 and fig.4 show the opening is asymmetrical), wherein the opening is in a basically elliptical shape (see fig.3) having a round shape at each of corner portions, and the round shapes of adjacent corner portions are different from each other (fig.3, shape of 152 and shape of 154 are different), wherein a portion at which the fatigue life of the casing is increased is a first corner at which the tensile stress is generated when forward driving force is input (fig.3, 152 or 122a); fatigue life is increased here due to the shape of the opening and its symmetry with respect to the longitudinal axis), wherein a curvature radius of the round shape of the first corner portion of the opening, where a tensile stress is generated when the driving force is input in the given rotational direction (fig.3, 152), is larger than a curvature radius of the round shape of a second corner portion of the opening (fig.3, 154 or 155c), where a compression stress is generated when the driving force is input in the given rotational direction,

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Downs et al. fails to disclose the fatigue life of the casing is also adjusted by heat treatment, and wherein the first corner portion of the opening of the casing is a heat treated corner portion.

Dison et al. teaches the use of heat treatment and physical treatment of surfaces of steel for the purpose of providing higher strength and longer wear characteristics and to eliminate residual stresses and making stress concentrations more uniform (col.1, lines 25-34).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the casing disclosed by Downs et al. to be heat treated and physically treated at the first corner portion or any of the corner portions where the stress concentrations demanded such treatment; for the purpose of providing higher strength and longer wear characteristics and to eliminate residual stresses and making stress concentrations more uniform (col.1, lines 25-34).

Furthermore, it is well known in the art to use heat treatment and physical treatments to improve characteristics of materials and it would have been obvious to one having ordinary skill at the time of the invention to try these different treatments on the casing according to it's current physical characteristics.

Regarding claim 16, Downs et al. discloses the casing includes a support portion (fig.6, 20) that contacts the support member, and the fatigue life is measured by inputting the driving force in the input portion without rotating the support portion.

Regarding claim 17, Downs et al. discloses the casing includes an output portion (fig.3, 40) that is provided at a position that is different from a position of the support

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portion, and the fatigue life is measured by inputting the driving force in the input portion without rotating the output portion.

Regarding claim 18, Dison et al. discloses the use of induction hardening as the form of heat treatment (col.1, line 25).

Regarding claims 19 and 20, Downs et al. fails to disclose the casing includes a physically treated corner portion of the opening and that the first corner portion is the physically treated corner portion.

Dison et al. teaches the use of physical treatment to materials in order to eliminate residual stresses and promote stress concentration uniformity (col.1, lines 29-34).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the first corner of the opening disclosed by Downs et al. with the physical treatment as taught by Dison et al. in order to eliminate residual stresses and promote stress concentration uniformity (col.1, lines 29-34). The first and third (fig.3, 152; upper right corner) corners experience higher tensile stresses due to the nature of the design and thus one of ordinary skill would understand these corners would benefit from the treatment.

Regarding claim 21, Dison et al. discloses shot peening as the form of physical treatment (col.1, lines 29-34).

Regarding claim 22, Downs et al. discloses the opening further comprises a straight portion that is located closest to the output portion (fig.3, there is at least one very small straight portion located closest to the output portion; if one zooms into the

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opening far enough there would be a straight portion), and wherein the straight portion is perpendicular to the longitudinal rotational axis of the differential gear casing (fig.3, there is at least one very small straight portion perpendicular to the rotational axis at a point where the corner 155c beings to develop).

Regarding claim 23, Downs et al. discloses the claimed invention except for disclosing that the curvature radii of each of the corner portions are different. It would have been an obvious matter of design choice to use different radii of curvature for the different corner portions since applicant has not disclosed that ***each of the curvature radii of each of the corner portions are different*** solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the shape disclosed by Downs et al. where the adjacent corner portions are of different radius of curvature.

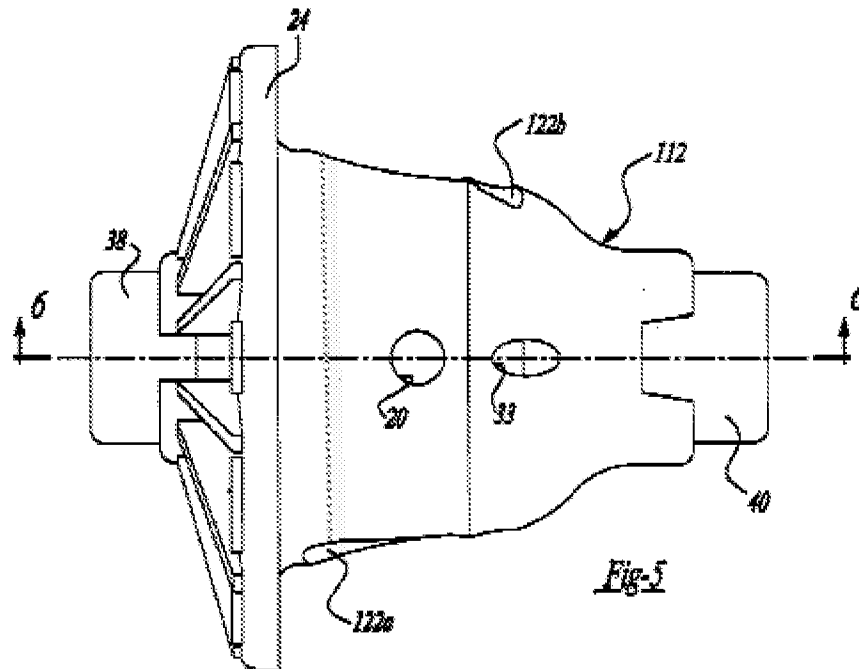
Regarding claim 24, the combination of Downs et al. in view of Dison et al. discloses the adjacent corner portions to the first corner portion are not heat treated corner portions since the stress concentrations on these corner portions do not require the heat treatment. Thus it would have been obvious to not heat treat the adjacent corners to the first corner.

Regarding claim 25, the combination of Downs et al. in view of Dison et al. discloses the first corner portion has increased strength relative to other corner portions of the openings of the casing (The heat treatment would increase the strength of the first corner portion).



Regarding claim 26, Downs et al. discloses a third corner portion not adjacent the first corner portion (fig.3, 152 upper right portion), the fatigue life of the casing is also further increased at the third corner portion (due to the shape of the third corner portion, its fatigue life would be increased accordingly as it is for the first corner portion. Additionally, heat treatment could be performed to the third corner portion).

Regarding claim 27, Downs et al. discloses the opening is a first opening (fig.3 shows the first opening), wherein the casing includes a second opening (fig.4, shows a second opening identically dimensioned) identically dimensioned as the first opening; wherein the support member includes a first hole (fig.5 and 6, holes 20) and a second hole (fig.5 and 6, hole 20), and wherein a circumferential distance around the casing between the first opening and the first hole is greater than a circumferential distance around the casing between the second opening and the first hole (see fig. 5 below; in order to define a circumferential distance, you must first define a circumferential line in order to measure that distance. As can be seen clearly below, the portion of the red circumferential line above line 6 would be larger than the portion of the red circumferential line below line 6 and thus Downs et al. reads on the limitation. The openings in applicant's invention are also mirror images and thus would share the same characteristics as the prior art. Downs et al. simply does not show a cross-section view according to applicant's figure 5, otherwise the relationship of the circumferential distances would be even more clearly evident.).



### ***Response to Arguments***

Applicant's arguments with respect to claims 15-27 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS DIAZ whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Friday 8:30am to 5:00pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas Diaz/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656